

PRX-40/A
Proximity Reader
Product Manual

Synel Industries Ltd.

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1. Introduction

The PRX-40/A proximity reader access unit is one of the compact access control - unit series manufactured by Synel. The card must be placed at a distance of about 10 cm from the device.

This reader can work as a stand-alone reader, or with a master controller connected to upto 16 reader units.

It was developed as a compact, easy-to-use proximity terminal, granting access to secure areas. The PRX-40/A works with various unit settings, according to a predefined security level. This device is made of strong ABS plastic.

Defining parameters in PRX-40/A is simple while maximum security is enabled by using the set-up 8 digit code (the default number is 12345678) greatly improving security.

In stand alone mode PRX-40/A grants secure access for approximately 285 card holders, stored in an authorized list within the terminal. This list is created and edited on the unit's compact keyboard, eliminating the need of connecting to a computer.

When working in online mode (as of Master version 3.20), the PRX40A unit uploads employee data from Master to its own memory and relay on this data when allowing/rejecting an employee if the connection with Master is lost.

PRX40A can manage unauthorized (black list) or authorized (white list) employee lists for access control purposes.

1.1 PRX-40/A Apparatus

The proximity reader access unit may be mounted on a wall. The enclosures include a PC board assembly.

Over and above operating as an access terminal, the PRX-40/A terminal has additional circuitry for storing card-holder data. Operating power for the unit is obtained from a wall adapter.

2. Installation

2.1 General

The PRX-40/A proximity unit can be installed in any building. The back panel of the unit serves as an installation template. Mounting screws and anchors are also provided. Follow the guidelines below:

- The installation location selected should be as far away as possible from electrical power source reference such as power equipment, computers, motors, pumps, etc.
- If you are installing more than one Synel proximity reader, make sure the readers are installed at a distance of at least 50 cm from one another (a distance longer 5 times their reading limit).
- Near metal objects reading range may decrease.
- Use a linear power supplier and not a switching power supplier. A switching power supplier auto-generates an electro-magnetic field that shortens the reading range. It is advisable to connect an independant power supplier to the reader.
- Make sure that the reader is not in a metallic materials surroundings. When mounting on a gypsum wall, make sure that there is no rear metallic reinforcement. If the reader is mounted on a concrete wall the reader must be mounted up to 20 cm from the wall.
- It is recommended that when swiping the badge it will face the reader. Thus, the badge will receive maximal energy.
- Use a power adaptor dedicated to the proximity reader access unit. Make sure the adaptor carries a safety recognition marking: UL, CSA or CE.

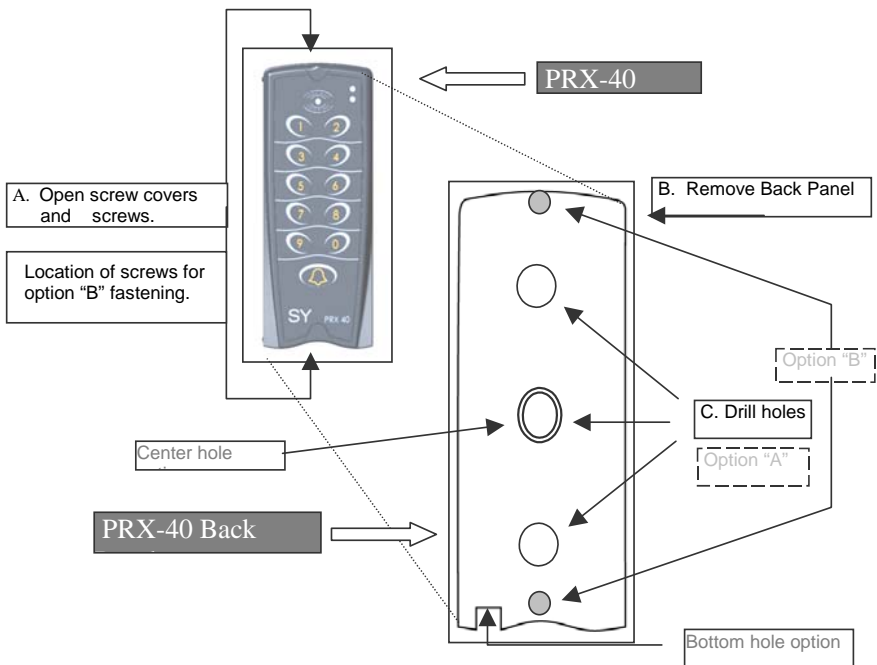
2.2 Mounting

Option A

1. Remove screw covers and screws from top and bottom of the unit.
2. Open the back of the unit.
3. Drill both fastening holes at either end and one hole towards the center for the cable.
4. Fasten the back of the unit to the wall.
5. Connect the cable wires via middle hole or bottom hole option (see diagram).
6. Close the unit.
7. Replace the screw covers.

Option B

1. Remove screw covers and screws from top and bottom of the unit.
2. Hold the unit against the wall and mark the drilling location through the screw holes.
3. If the cable wires use the middle hole option, remove the back panel and use it to mark the position of the cable hole (center of panel). Drill the cable hole in the wall.
4. Drill the two fastening holes in the wall.
5. Connect the cable wires via middle hole or bottom hole option (see diagram) as required.
6. Fastened the unit to the wall with screws provided.
7. Replace the screw covers.



2.3 Connect wires

Connector J5/14 pin

Wire No.	Wire Function	Present Color Code
1	Vin Power (Power Input)	Red
2	Gnd	Black
3	- TxRx RS-485	Grey
4	+ TxRx RS-485	Purple
5	TxD RS -232	White
6	RxD RS -232	Dark Green
7	Alarm	Brown
8	Relay common (C)	Blue
9	Normally Closed (N.C)	Yellow
10	Normally Open (N.O.)	Orange
11	Bell (1)	Pink
12	Bell (2)	Light green
13	Sensor input: Dry contact or AC/DC. Sensing regard jumper JP23 settings	Light Blue
14		Brown/White

Connector J4 (9 pin)

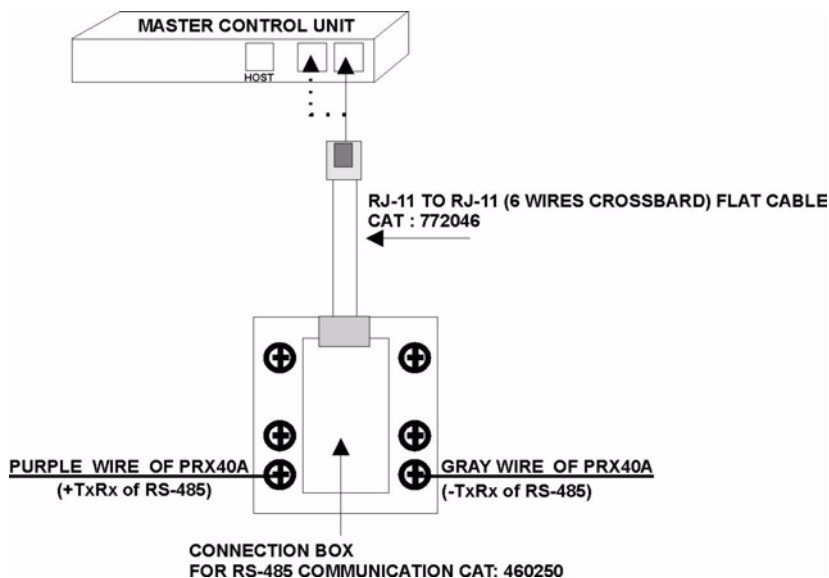
ISP Connector J12 (6 pin)

Connector J13 (14 pin)

Keyboard connector

(programming the CPU slave)

Option for external reader

How to connect the PRX40A to the Master controller:

2.4 Jumpers

Jumper	Function	Default
JP2 (SMD)	JP2 closed and JP3 open = Linear decoding	Linear
JP3 (SMD)	JP2 open and JP3 closed = Synel decoding	
JP4 (SMD)	Cross point decoding (currently NA)	
JP7 (SMD)	Connect RS-485 termination resistor	Open
JP10 (TH)	W.D. Reset for the master CPU- [1-2] Closed Programming of the master CPU - [2-3] Closed	[1-2] closed
JP11(TH)	PSEN (Programming) - must be closed when programming the master CPU.	Open
JP12 (SMD)	Tamper switch enabled [1-2] closed Tamper switch disabled [2-3] closed	[2-3] closed
JP20 (T.H)	Closed- Stand alone Open- Online with Master	Closed
JP21 (T.H)	Contacts switching protection in DC- closed Contacts switching protection in AC- open	Closed
JP22 (SMD)	Connecting clock to slave CPU	[2-3] closed
JP23 (T.H)	Select sensor option: [1-2] and [3-4] Closed - dry contact [2-3] Closed - AC/DC	[1-2] and [3-4] closed
JP24 (T.H)	Reset for the slave/reader CPU- [2-3] closed Programming of the slave/reader CPU [1-2] Closed	[2-3] closed

3. Set-up mode

PRX-40/A programming can be divided to three categories:

1. Access Cards configuration (authorized personnel)
2. General definitions
3. Indicator definitions

All definitions of Management modes are listed in the table below.

The codes in the table below can be used only after completing set-up mode as follows:

Step 1: Press 3 times simultaneously on function keys 1 & 2 (each time will be followed by a short beep and an orange led will be lit).

Input	Indicator signalling
1st 1&2	Short beep+2nd red led ON
2nd 1&2	Long beep+2nd red led ON
3rd 1&2	2 long beeps+2nd green led flashes

Step 2: Enter the 8 digit master code (the default number is 12345678). Then insert the relevant set-up code (see next page).

3.1 Access cards configuration

Parameter	Set-up Code	Function	Comments	Default
Sensor mode	30	0 Door open request 1 Door Sensor		Door open request
Sensor type	31	0 N.O 1 N.C		N.C
Sensor door active time (open)	32	000-255	Define in seconds	15 sec.
Toggle relay mode	33	0- Disable 1 - Enable	In minutes	Disable
Toggle relay time-out	34	00-99	Define in seconds	00- Disabled
Card list type	35	1- Black list (Rejected) 0- White list (Accepted)		0
Alarm mode	51	0 Latch (led is on) 1 Pulse (led is off)	1 = Led is off depending on pulse time (code 52)	
Alarm pulse activating time	52	0000-9999	You must always key-in time in a four digit format: 10 sec. = 0010	0 sec.
Door opening time	10	000-255	In 1/10 seconds step (0 to 25.5 sec.)	3 sec.
Communication ID	14	1-16	Defines terminal ID	01
Operation mode	12	0 Card only 1 Global code only 2 Card or code (card no.) 3 Card and global code 4 Card and pin code 5 Card and finger 6 Code and finger (finger only)	----- Functions 5-6 only with PrintX	There is a different code for each employee

Parameter	Set-up Code	Function	Comments	Default
Duress code enable/disable	50	0 Disable 1 Enable	Activating alarm and relay output	
Define duress code	53	0000-9999	Active in operation mode 1,2,3,4	
Card reading/ check parameters	11	1,2- Offset (01-37) 3,4- Length (01-06) 5,6- Total Characters		01 16 00
New master code	13	00000000-99999999	8 digit code	
Erase all cards	60	Master Code	Type master code - 8 digits	
Initialisation of memory	61			
Vocal ID indication	7		Long buzzer for tens Short buzzer for uniques	
Reset alarm	4		When the alarm is in latch	
Control door	0			
New global code	15	4 digit new code		9999
Insert card using card	20	1. Swipe card 2. Insert pin code (If Operation Mode is 4) Terminal reverts to 1. ----- Fingerprint (Operation-Mode 5): 1. Swipe card (2 beeps confirm swipe). 2. Place finger Terminal reverts to 1.	According to operation mode press 7&8 simultaneously in order to revert to normal mode (press Enter in terminals that consist of an Enter key). ----- Mode 5 only with PPrintX *	
Delete card from list using card	21	Card		

* Note:

After swiping all cards, you should wait time-out or press 7&8 simultaneously (press **Enter** in terminals that consist of an **Enter** key) once. Then all data will be saved!

Parameter	Set-up Code	Function	Comments	Default
Insert card using keyboard	22	1. Key-in card 2. Insert pin code (In Operation Mode-12 press key no. 4) Terminal revert to 1. ----- Fingerprint (In Operation Mode-12 press key no. 6): ----- 1. Key-in code (depends on card length). 2. Place finger Terminal reverts to 1.	According to operation mode press 7&8 simultaneously in order to revert to normal mode. (press Enter in terminals that consist of an Enter key) ----- Mode 6 only with PPrintX	
Delete card using keyboard	23	Card number		
Insert card by Index	24	1. Card index 4 digits from 0000-0300 2. Swipe card In Operation Mode-12 press key no. 4: 3. Insert pin code	Highest possible index depends on card length (code 11)	
Delete card by index	25	Card index - 4 digits		

Time Out

After every entry a LED is lit (while waiting for the next entry). After the LED goes out the unit exits the “Programming Mode” and resets (action must be repeated from the beginning).

3.1.1. Management of Access Cards (authorized personnel)

Managing access Cards can be performed three ways:

Using Keyboard - Keying-in the keyboard the card number

Using Card - Swiping the card

By Index - Enables deleting an employee without a card

Using Keyboard

Build list:

After entering set-up mode key-in code 22 (key-in card number to list) (Up to 13 characters in Linear decoding) and key-in all relevant cards. After each keyed-in card number 2 short beeps will indicate that the number was registered successfully. After keying-in all card numbers press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Note: In operation mode 4 - card and pin code, the user must key-in the card number and then key-in the pin code for each card (4 digit code).

Delete list:

After entering set-up mode key-in code 23 (Delete card by keyboard) and key-in all irrelevant cards. After each keyed-in card number 2 short beeps will indicate that the number was deleted successfully. After keying-in all card numbers press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Using Card

Build list:

After entering set-up mode key-in code 20 (Insert card to list by card) and swipe all relevant cards. After each swiped card 2 short beeps will indicate that the number was registered successfully. After swiping all cards press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Note: In set-up code 12: operation mode no. 4 - card and pin code, the user must swipe the card and then key-in the code (a 4 digit code).

Delete list:

After entering set-up mode key-in code 21 (delete card by card) and swipe all irrelevant cards. After each swiped card 2 short beeps will indicate that the number was deleted successfully. After swiping all cards press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Note: Whenever a task is completed successfully, a LED flashes and the buzzer beeps.

By index

Insert cards:

After entering set-up mode, key-in code 24 (Insert card by Index) and key-in a 4 digit index, swipe card. 2 short beeps will indicate that the number was registered successfully. After swiping all cards press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Delete cards:

After entering set-up mode key-in code 25 (delete card by index) and key-in a 4 digit index. 2 short beeps will indicate that the index was deleted successfully. After swiping all cards press 7&8 simultaneously (mandatory) (press **Enter** in terminals that consist of an **Enter** key) in order to revert to normal mode.

Terminology

Card Only - Control is performed by Card only.

Global Code only - common global code (4 digit code – used by all card-holders).

Card or code - Control is performed by Card or keying-in number of card (the length of the keyed-in number must be identical to the defined card length).

Card and Global Code - Control is performed by Card and a common global code (four digit code – used by all card-holders).

Card and PIN Code – Control is performed by Card and a personal four digit code. This mode is the most secure.(4 digit code – used by each card-holder).

3.2 General definitions

Open Door

Access can be given by using a Master Code. After entering “Programming Mode,” enter “0”.

Open Door Time

It is possible to adjust the “window” of accessibility during which a door opens when accessed. To change the accessibility time, after entering the “Programming Mode,” enter “10” and then four digits. For example if you enter 0015, the accessibility time is 1.5 seconds.

Set Global Code

You can change a Global Code by way of “Instruction Code” – 15. After

entering “Programming Mode” enter “15” and afterward a four digit number that will be the new Global Code.

Set New Master Code

The Master Code can be change by way of “Instruction Code” – 13. After entering “Programming Mode” enter “13” followed by a eight digit number that will serve as a new master Code.

Note: It is recommended to change master code when setting up.

Erase All

Warning:! Cards can not be restored after erased!

After entering the “Programming Mode,” enter “6” and then eight digits Master code.

3.3 Indicators definitions

After entering setup mode:

Input Operation Mode

Code 30 --> 0 = Door open request button
 As a result the door will open and the output = bypass
 1 = Door sensor
 As a result the output = alarm will be activated (led/buzzer)

Sensor type

Code 31--> 0 = The sensor will function as Normally Open.
 1 = The sensor will function as Normally Closed.

Alarm mode

Code 51--> 0 = Latch. The alram does not go off unless it is turned off manually.
 1 = Pulse. The alram goes off after the defined time-out.

Alarm pulse activating time

Note: Relevant when alarm is in pulse mode.

Code 52--> 0000-9999 seconds (always key-in time in 4 digits format)

Sensor door activating time

Code 32--> 000-255 time-out seconds. The alarm will be activated after the defined time-out.

Duress code enable/disable

Code 50--> 0 = Disable
 1 = Enable
 In operation modes card and global code or card and pin code
 enables activating the alarm and the door simultaneously.

Define Duress code

Code 53--> 0000-9999
Enables defining what will be the duress code

Card parameters

Refer to how the proximity track will be read:

2 digits	Start position (01-37)	Card number offset
2 digits	Length (01-06)	Card number length
2 digits	Total characters	Number of digits on card (when defining 00 - doesn't check card length- accepts all card lengths upto 6)

Reset alarm

In set-up mode, after keying-in code 51, key-in 4 to shut-off the alarm.

4. Communication

Interfacing the host is performed via the Master unit. Communication between the master unit and the terminals is performed at 19200 bps.

Downloading card numbers from Master to terminals

As of Master version 3.20 there is an additional option “Send offline list to Access units”. All card numbers that are marked as (see Falcon | Personnel | Card Type | Active - Allowed offline) **Active - Allowed offline** will be sent from the Master to the terminals. When communication is stopped the Terminal will enable access for the cards as mentioned above.

PRX40A supports this option as of version 2.04.

4.1 Communication cables characteristics

Follow the listed guidelines when installing the communications cables:

The cable should not be installed near EMI factors, such as:

- Motors, generators, alternators, and transformers
- Air conditioners, elevators
- Radio/television transmitters, signal generators and internal communication networks
- Cables: within 30 cm. (1 foot) of power lines of less than 5 KVA.
- Cables should not be within 60 cm. (2 feet) of power lines in the 5-10 KVA range.

Cables should not be within 1.5 meters (5 feet) of power lines of more than 10 KVA. The cables should not run parallel to power lines for more than 15 meters (49 feet).

It is best to use a single cable for the communication line. If it is not possible to use a continues cable only one indoors connection is allowed, constructed in one of these options:

1. Using two connectors with appropriate shielding and cover.
2. Using a connection box.

For aerial installation, use N.Y.Y. shielded cables.

4.2 Technical Specifications

4.2.1. Man-machine Interface:

- Indicators for power
- Indicators for card presence/rejection
- Keyboard entry
- 10-digit keyboard
- Bell button
- Buzzer for confirmation of operations

4.2.2. Mechanical features

- Dimensions: 13 x 4.3 x 2 cm
- Weight: 180g
- Operating temperature: -22 to +50_C
- Relative humidity: 95%

4.2.3. Electrical characteristics

- Output relay rating: 24Vdc @ 2 A
- Alarm sensor output TTL level mx @ 16 mA. , Alarm set at "High"
- Sensor Input: 9 -18V @ 10mA (in Non dry contact mode)
- Power supply: 9 to 15 Vdc, max @ 100 mA.

Door open request button - the entry will enable opening the door.

Door sensor - the sensor will indicate that the door was forcefully opened.

Appendix A - Fingerprint Unit

PRintX40AI/V is a biometric stand-alone controller, one of the series of Synel's access control protocols. It is a unit that operates with either a fingerprint verification version - PRintX40AV or a fingerprint identification version - PRintX40AI further to user-card reading (by the proximity unit). The proximity and biometric units are adjacently installed at sensitive locations for granting access to secure areas. The PRintX40AI/V works with various unit settings, according to the security level required at the location of the unit. Defining parameters is simple while maximum security is enabled by using a password defined by the user. Access is available for upto 1000 card holders in the verification version, and upto 200 card holders in the identification version, stored in an authorized list. This list is created and edited using keyboard.

1. Differences between PRintX40AI & PRintX40AV

- (PRintX40AI) Identification does not require a card/code. Upto 200 fingerprint templates are stored in the terminal's memory. Whenever an employee places his finger on the sensor, the FP (fingerprint) unit polls all existing templates until there is a match and confirms/rejects.
- (PRintX40AV) Verification requires a card/code. The template is stored in reference to a card/code. Upto 1000 card/codes and templates are stored. When an employee swipes his card/keys-in his code, the unit checks if the card/code number exists, if it does it checks also the template assigned to that number.

2. Technical Specifications

- Maximum Range: 10 cm (4 inches)
- Operating Frequency: 125 kHz
- RS-232 or RS-485 (ASCII); 9600 b/s
- Storage for 1000/200 templates
- False rejection rate: 0.01%
- False acceptance rate: 0.01%

2.1 Indicators

A led is activated to indicate current status as follows:

Flashing orange	A flashing orange led indicates that the employee is requested to place his finger for sampling purposes, while Enrolment process is on.
Orange	Waiting for fingerprint validation, while performing verification.
Green	Successful operation.
Red	Operation failed.

2.2 Man-machine Interface

- Indicator for: Power, card confirmation/rejection and keyboard entry, fingerprint (a tri-color led)
- 10-digit keyboard
- Bell button
- RF coupling of proximity card
- Buzzer for audio confirmation of operations

2.3 Mechanical Features

- Dimensions: 137X115X28 mm
- Weight: 360gr
- Operating temperature: 0 to +60°C

2.4 Electrical characteristics

- PPrintX40AI_V Power supply: 12Vdc, @ 0.5A
- PPrintX Power supply: 5Vdc @ 1A
- Output relay rating: 24 V @ 3 A
- Tamper sensor output TTL level max @ 16 mA

2.5 Package

- PPrintX-40I_V proximity reader
- PPrintX biometric reader verification/identification
- PPrintX/P power supply adaptor: 5 Volt/1 A stabilized wide range input 100-240 AC input

- RJ-11 Connection box with 5V power input
- RJ-45 Connection box
- Four 3.5x50mm Philips screws, four 3.5x19mm Philips screws and four for position B, four Brick/Plastic anchors
- Mounting template
- User manual

Recommended: PPrintX-40I_V Power supply adaptor: 12 to 15 Vdc, max @ 880 mA

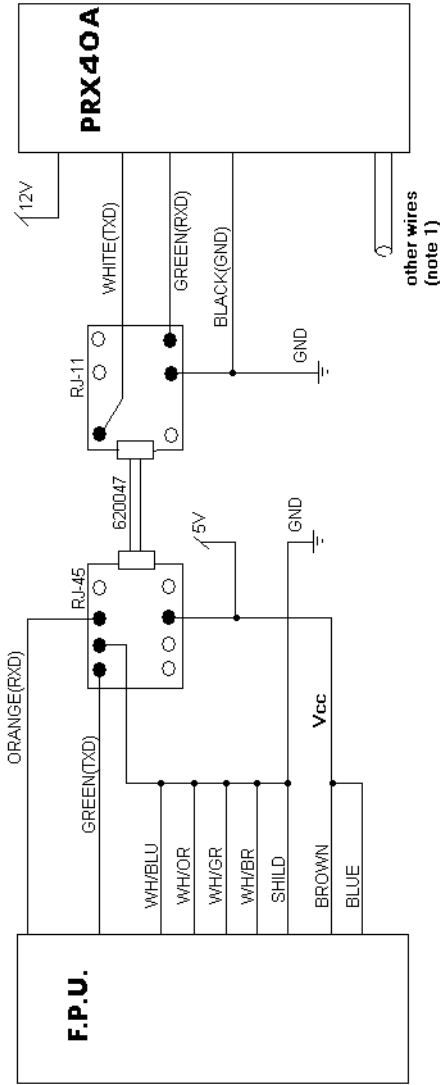
3. Installation



Note: When working with PPrintX40A/I (Identification), you can install the PPrintX on the external side of the door and the PRX40 on the internal side of the door.

3.1 **Wiring**

PRintX40/AI or AV Connection



Note 1: For connection instructions for other wires refer to paragraph 2.3. on page 4.

3.2 FPU operation - Instructions and regulations:

- In view of our experience, we strongly recommend that each employee practices finger positioning on the sensor prior to actual enrollment!
- Avoid using thumb and pinky fingers since they are typically awkward to position consistently on the sensor.
- Place the higher joint of your finger on the ridge lock and lower your finger onto the sensor surface (make sure all other fingers are held straight to avoid creating an angle between the enrolled finger and the sensor surface - incorrect positioning).
- Touch the sensor's plastic casing (black) in order to discharge static electricity. Keep your finger steady!
- Press your finger gently onto the panel, avoid excessive pressure as it will blur the print.
- Make sure your finger is touching the sensor's drive ring.
- It is recommended that quality be 50% and content 90% at least.
- Make sure you use the enrolled finger for verification!
- If your finger is extremely dry, touch your forehead or the side of your nose before placing it on the sensor.
- Do not use a wet/moist finger for scanning.

Note: For user's convenience mount the terminal at a height of 1.4 meters (55.2") (measured from the top end of the terminal to the floor) and at a distance of 15 cm (5.9") from the right-side wall (closer to the sensor side).

Note: If it is impossible to sample an employee's fingerprint, you can disable finger verification and revert to card or code mode instead.

4. Maintenance

You should always touch the conductive plastic before touching the PPrintX sensor in order to safely discharge any static electricity on your skin or clothing.

Do not:

- Place the fingerprint sensor close to a heating source, such as a radiator or hot plate.
- Spill any liquids on the sensor with the exception of isopropyl alcohol.
- Subject the fingerprint sensor to heavy shocks or vibrations.
- Allow the sensor to come in contact with metallic objects.